UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,119	11/18/2003	Kiyohito Mukai	L8462.03118	2755

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EXAMINER
DOAN, NGHIA M

ART UNIT	PAPER NUMBER
2825	

DATE MAILED: 12/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/715,119	MUKAI ET AL.
	Examiner	Art Unit	
	Nghia M. Doan	2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>03</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/08/2006*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some *   c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)   4)☐ Interview Summary (PTO-413)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   Paper No(s)/Mail Date. _____ .

3)☐ Information Disclosure Statement(s) (PTO/SB/08)   5)☐ Notice of Informal Patent Application

    Paper No(s)/Mail Date _____ .   6)☐ Other: _____ .

DETAILED ACTION

1.   Responsive to communication application 10/715,119 and Applicant Amended

filed on 11/08/2006, claim 20 remains pending.

Claims 1-19 have been canceled.

Claim 20 has been added.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

3.   Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being

incomplete for omitting essential steps, such omission amounting to a gap between the

steps. See MPEP § 2172.01. This claim recites *the correcting step that decreases the*

*density of contact holes become less predetermined limitation value **without changing***

the size of the contact holes. There has two possible solutions:

(1) by increasing wiring sizing; and /or

(2) by reducing/removing a number of contact hole from wires.

Those two possible solutions of decreasing the density of the contact holes must

be associated with Design Rule Checked (DRC) when wiring size changed and the

electrical characteristics of circuit layout, such as: current density as removed contact

holes, electro-migration, voltage drop, ... etc. These factors have not been taken into

account of the claimed invention. Therefore, the claim 20 is missing the steps/elements

essential to the claim limitation of decreasing the density of contact holes without

changing the size of the contact holes.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

5.   Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allen et

al., (hereinafter as "Allen") (US Patent 6,904,575).

6.   With respect to claim 20, Allen teaches a method for circuit design layout

verification by using LVS test tool *(the abstract)*, that dues to vias flare or redundant vias

which cause a particular via to short when a large number of vias are clustered together

that is above a predetermined threshold *(the density of contact holes (vias) in the wires)*

(col. 3, ll. 9-11, ll. 32-34 and claim 1, col. 8, ll. 63-64) using the DRC *(predetermined*

limitation value) algorithm to locate potential vias short, which are close enough to

cause vias short *(wiring defective) (col. 4, ll. 1-39 and fig. 4, steps [410-440] and claim*

1, col. 8, ll. 65-67). The potential vias short and cluster vias short are identified and

removed for efficiency when vias is determined safety *(fig. 3, steps [350], [360], and*

[370], col. 4, ll. 40-67 and col. 5, ll. 17-33, and fig. 7B). After the potential vias short or

redundant vias are removed that creates more space *(less density vias)* between vias in

the cluster, those remained vias have enough space amount is not causing a vias short

as using DRC algorithm *(fig. 5, steps [510-530], col. 6, ll. 44-65)*.

        However, Allen does not explicitly teach the size of vias is changed or

unchanged during the correction process *(removed vias short or redundant vias)*.

Therefore, it would have been obvious to one of ordinary skill in the art to determine that Allen reference discard about via size, just focus on the number of vias or spacing between via. In other word, Allen reference teaches a method reducing or decreasing vias density by removing potential vias short or redundant vias that reduces error in the circuit layout due to vias shorting that permitting verification of the the final design by standard verification tools.

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. PTO-892.

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.
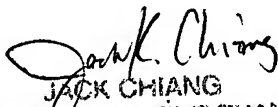
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nghia M. Doan whose telephone number is 571-272-5973. The examiner can normally be reached on 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Chiang can be reached on 571-272-7483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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JACK CHIANG
SUPERVISORY PATENT EXAMINER